DOCUMENT RESUME

ED 022 055 08 VT 006 519

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PROJECT "SIP" - SOLVING INDUSTRIAL PROBLEMS. FINAL REPORT.

Utah Research Coordinating Unit for Vocational and Technical Education, Salt Lake City.
Spons Agency- Office of Education (DHEW), Washington, D.C.
Bureau No- BR 6-3046
Pub Date Jul 68
Grant- OEG-4-7-063046-1612
Note- 57p.
EDRS Price MF-$0.25 HC-$2.36
Descriptors- EXPERIMENTAL PROGRAMS, GROUP DISCUSSION, INDUSTRY, INSERVICE PROGRAMS, *INTERACTION, OBSERVATION, PROGRAM ATTITUDES, PROGRAM IMPROVEMENT, QUESTIONNAIRES, SCHOOL ENVIRONMENT, *SCHOOL INDUSTRY RELATIONSHIP, *SUPERVISORS, *TRADE AND INDUSTRIAL EDUCATION, *TRADE AND INDUSTRIAL TEACHERS, WORK ENVIRONMENT
Identifiers- Salt Lake City, Utah

The objective of this project was (1) to increase knowledge of industrial conditions, requirements and vocational education programs among selected teachers, industrial supervisors, and apprenticeship personnel, and (2) to increase communication and cooperation among these people for the purpose of bringing graduates of vocational trade and industrial programs closer to the employment needs of industry. Participants were 20 high school teachers of trade and industrial subjects, 20 industrial supervisors, and a small number of representatives of union apprenticeship programs in the Salt Lake City, Utah area. Methods included visits to schools by the industrial supervisors, visits to industry by the teachers, observation of union apprenticeship council meetings by each teacher, and subject area discussion meetings for each skill group. A questionnaire was administered to the participants at the beginning and end of the project to obtain information on such items as the adequacy of high school vocational programs, and suggestions for improving or changing these programs. The program proved effective in generating ideas for changes in or additions to programs of vocational trade and industrial preparation and in stimulating cooperative efforts between teachers and industrial supervisors. It is recommended that such a program be implemented at the district level in the State of Utah. (HC)

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July 1968

U.S. DEPARTMENT OF HEALTH
EDUCATION, AND WELFARE

Office of Education
Bureau of Research

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# PROJECT "SIP" - SOLVING INDUSTRIAL PROBLEMS

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The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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## SUMMARY

Statement of the Problem: In order to prepare students for productive employment, programs of vocational and technical education must reflect industry's requirements and needs. The problem was to develop a program which would increase knowledge of industrial conditions and requirements, and vocational education programs among teachers and industrial supervisors, and to increase communication and cooperation between these people.

The specific objectives of the project, among a selected group of T & I teachers and industrial supervisors, were:
1. To increase the teachers' knowledge of industry's requirements for new employees for employment and for training in apprenticeship programs;
2. To increase knowledge of school programs and teachers' problems among industrial supervisors;
3. To increase communication between these groups aimed at obtaining suggestions for changes in or additions to vocational education programs in order to produce graduates better able to meet the needs of industry;
4. To establish closer personal and working relations between teachers and their industrial teammates.

Method: Participants in the program were 20 teachers of Trade and Industrial subjects in high schools in the Salt Lake area; 20 industrial supervisors, and a small number of representatives of union apprenticeship programs. The program had several phases: visits to the schools by the industrial supervisors for a half day each month for three months; visits by the teachers to their teammates' firm for a half day each month for three months; observation of a union apprenticeship council meeting by each teacher; subject area discussion meetings for each skill group. A questionnaire was administered at the beginning and at the end of the project to obtain information about the participants' views concerning the adequacy of high school vocational programs in their fields, their suggestions for improving or changing these programs, their ideas about problems faced by teachers of the various vocational subjects, and changes in these attitudes, suggestions and ideas from the beginning of the project to its conclusion.

Conclusions: Although the questionnaires did not reveal large changes in attitudes about vocational T & I programs, the program did prove effective as a means of generating ideas for changes in or additions to programs of vocational T & I preparation and appears to be effective in stimulating further cooperative efforts between T & I teachers and their industrial teammates. For these reasons, as well as the favorable response of the participants, it is recommended that a program of this type be implemented at the District level in Utah. Additional recommendations reflect the participants' suggestions for improving T & I programs and for dealing with problems confronting instructors. These recommendations cover such subjects as course content, equipment and supplies, counseling, and means of further cooperation between industry and vocational T & I teachers.

# CHAPTER I

# INTRODUCTION

## A. Statement of the Problem

Vocational education in high schools is intended to prepare students for productive employment, as well as for entry into post-secondary vocational-technical programs. To accomplish the first of these purposes, the skills and knowledge possessed by graduates of vocational programs must reflect industry's requirements and needs. Unless those who teach vocational courses are aware of what will be expected of their students by employing firms, they cannot train students to meet these expectations. Likewise, increased knowledge by industrial personnel of school programs will enable them to have more realistic expectations of the abilities of new employees, and to advise educators on how to improve their programs.

The problem was to develop a program which would increase knowledge of industrial conditions and requirements, and vocational education programs among teachers and industrial supervisors, and to increase communication and cooperation among these people.

## B. Objectives

The purposes of Project SIP were, with a selected group of Trade & Industrial (T & I) teachers and industrial supervisors:

1. To increase the teachers' knowledge of industry's qualitative requirements for new employees, both for employment and for training in apprenticeship programs.

2. To increase knowledge of school programs and teachers' problems among the industrial supervisors.

3. To increase communication between these groups aimed at obtaining suggestions for additions to or changes in vocational education programs in order to produce graduates better able to meet the needs of industry.

4. To establish closer personal and working relations between teachers and their industrial counterparts.

## Hypotheses:

The hypotheses upon which the Project was based are:

1. If knowledge of industrial requirements and school programs was

increased among vocational T & I educators and industrial personnel, then some changes in attitudes about vocational T & I education programs should occur.

2. A situation structured for the evaluation of teaching programs, the discussion of problems, and consideration of constructive ways of dealing with these problems would produce suggestions for additions to or changes in vocational T & I programs.

3. The initiation of visits and meetings between the T & I educators and their industrial teammates would provide the stimulus for additional cooperative efforts.

## C. Limiting Factors

Several factors should be noted which limit the conclusions of this study:

1. Participants in the project were not randomly chosen. The teachers were selected by the various school districts and supervisors were selected by management to participate in Project SIP. It is possible that some bias entered into these selections. For example, the teachers selected may be the most interested in problems of vocational education and/or the best teachers, or they may be the least interested and/or the least able teachers (if the District attempted to use this as an opportunity to stimulate such teachers). Similar factors may have been at work in the selection of supervisory employees. Since the investigators do not know if such factors or others were involved in the selection of participants, the extent to which participants are representative of the populations they represent is not known.

2. The questionnaire used to gather data for the evaluation of the program was not pretested for validity or reliability. Perhaps the most serious omission was a test for stability reliability: there is no way to know to what extent the observed attitude change is due to the experimental procedure as opposed to random fluctuations in the test situation.

3. In some of the subject groups (auto mechanics, electroncs) the businesses from which participants were chosen do not appear to be fully representative of the range of employment opportunities open to graduates. Automobile service stations, and maintenance departments of rent-a-car agencies and bus and taxi fleets, for example, should have been included in the auto mechanics skill area group as well as automobile dealerships. The electrical industry had very limited representation (the Electricians Joint Apprenticeship Council); appliance repair shops and residential electricians should

have been included in the electronics skill area group. This was an error in selection of participants which might limit the usefulness of some of the conclusions of these groups.

4. "Hawthorne Effect" - The research design did not include a control on the "Hawthorne Effect"; the results of the experimental program, especially the performance of the teams and discussion groups, may have been influenced by the participants' consciousness of the experimental situation.

## D. Delimitations

1. Participation in Project SIP was limited to teachers of Trade and Industrial subjects in high schools in the Salt Lake area. No attempt was made to include high school vocational counselors, District vocational directors, or other administrative personnel.

2. This study included teachers in the public high schools only. Private high schools and public and private post-high school institutions were omitted.

## E. Definitions

As used in this report, the following terms are defined as follows:

Trade and Industrial Education (T & I) - Education which includes any subject which is necessary to develop the manipulative skills, technical knowledge, and related information such as job attitudes, safety practices, and trade judgment necessary for employment in a trade and industrial occupation.

Supervisory Employee - A person in a position of authority over a group of employees; for the purposes of this study, includes managerial level and non-managerial level personnel.

Joint Apprenticeship Council - A group of union and management representatives which administers an apprenticeship program and evaluates the progress of apprentices.

Skill Area - The particular subjects from among those included in the Utah State Trade and Industrial Curriculum which were included in this study. These were automotive mechanics, drafting, electronics, and machine shop.

Industry - Includes both private firms and one large military base which participated in the Project.

## CHAPTER II

## REVIEW OF LITERATURE

With their goal of preparing students for employment, vocational educators must be able to work closely with industrial personnel if their programs are going to produce graduates with the necessary knowledge, attitudes, and skills. The instructors must know of the changes in industrial technology and processes and have an awareness of the role that graduates of their classes will be expected to fill when employed in industry. Those responsible for vocational programs must therefore find ways to involve industry's participation and to enlist industry's aid.

There is recognition in the literature as well as in the public record of the value of involving industry personnel in vocational education. In an extensive consideration of the advantages and methods of cooperation between vocational teachers and the industrial community, Samuel Burt has written:

> Employers can gain desired training facilities, reduce their own training costs, and participate in the development of present and future workers. Labor gains a voice in the development of workers and in the development of training programs which meet the needs of members of their specific groups. The schools benefit by offering courses of instruction and training programs attuned to the needs of industry and labor, and therefore play a more meaningful role in the community which, hopefully, provides a broad base of community support for vocational and technical education.
>
> When industry and education ignore each other or fail actively to cooperate, the inevitable result is schools turning out unqualified workers and industry suffering skilled manpower shortages.[1]

The advantages of cooperative efforts among vocational teachers and industry are not limited to the effectiveness of such arrangements in improving programs, facilities, etc. As suggested in the passage quoted above, the public image of vocational education programs may be favorably influenced through activities which involve industry in vocational education programs. In a study of secondary vocational education and its role in the preparation of students for employment, a Pennsylvania State University research team investigated the attitudes of teachers, employers, and union officials toward vocational

1. Samuel Burt, Industry and Vocational-Technical Cooperation (New York:McGraw-Hill, 1967), pp. 41-42.

education. They found that the degree of involvement in vocational education was "most consistently associated with predictable differences in attitudes and opinions."[2]

Cooperative action between vocational educators and industry and labor personnel is possible on a wide range of issues and with varying degrees of involvement. Burt has enumerated a group of topics on which educators may profitably seek aid from industry:

> Initiation of new programs or expansion or elimination of established programs, interpretation of manpower and skill requirements in terms of curriculum needs, development of curricula, acquisition of shop and laboratory equipment, recruitment of instructors and students, public relations, and evaluation of school programs.[3]

Recognition of the desirability of cooperative efforts between industry and vocational and technical educators appears in various governmental legislative acts and official publications. Rules and regulations concerning vocational education issued by the U.S. Office of Education have since 1917 supported industrial participation in vocational programs, although prior to 1963 the establishment of advisory committees and similar groups was primarily dependent on local and State initiative.[4] Under the provisions of the Vocational Education Act of 1963 the establishment of vocational education advisory committees to the U.S. Commissioner of Education and to the Secretary of Health, Education, and Welfare is required. In addition, the participation of industrial personnel in educational programs at the State and local levels is a necessary condition for the receipt of Federal funds under the Vocational Education Act.[5]

Likewise State legislation and State Plans for Vocational Education have encouraged the cooperation of industry with vocational educators, in some cases since 1913.[6]

2. Jacob J. Kaufman, et. al., The Role of the Secondary Schools in the Preparation of Youth for Employment (University Park, Pa.: The Pennsylvania State University, Institute for Research on Human Resources, February 1967), p. 7-40.
3. Samuel Burt, "Industry Participation in Local Public School and Technical Education" in Sar A. Levitan and Irving H. Siegel, Eds. Dimension of Manpower Policy: Programs and Research (Baltimore, Maryland: Johns Hopkins University Press, 1966), p. 183.
4. Burt, Industry and Vocational Technical Cooperation, pp. 305-310.
5. Ibid., pp. 310-313.
6. Ibid., pp. 313-319.

The most common form of industry-education cooperation is the advisory committee -- either functioning in a specific occupation or skill area such as carpentry or electricity, or general advisory committees with members from all parts of the community to advise on the vocational program as a whole. Although the type of counsel presented by such committees is necessary, adequate use has not been made of them in the past.

In Burt's investigation of industrial involvement in vocational education, he notes that the use of both general and occupational committees has been quite limited.[7] Similarly, the research team at Pennsylvania State found in the nine cities that they studied, that in general advisory committees did not exist and that those which did exist were in individual skill areas, schools or geographic areas and were not generalized throughout a community.[8]

The situation in Utah has been essentially similar to that in other parts of the country. Federal legislation requires the establishment of a State Advisory Council on Vocational Education and the State Plan for Vocational Education implements this requirement. This advisory council has functioned as a continuing body only since 1964; it meets four times a year. In addition, there are vocational education advisory committees for each School District in the State. The degree of activity of these local committees varies with the interest of local leadership.

Since 1964, some high school vocational teachers in Utah have had indvidual advisory committees composed of industrial personnel in their subject area. However, only a minor portion -- perhaps 20% -- of all vocational teachers in the State have such a committee. It is estimated that within the Trade and Industrial area there are advisory committees for perhaps half of the teachers; only about 10-15% of these committees actually function, and in few instances does a dialogue actually take place between the teacher and the members of his advisory committee.

The general absence of active cooperation between vocational educators and their industrial counterparts in Utah is reflected in the findings of a survey of vocational education in Utah conducted by the George Peabody College for Teachers in 1966. Of the 132 firms replying to the survey inquiry, 45 stated that they did discuss their

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7. Burt, "Industry Participation...", p. 189.
8. Kaufman et. al., Role of the Secondary Schools..., pp. 4-19--4-21.

manpower needs with education officials, but 67 did not state this. A question was asked concerning whether school guidance counselors had visited the various business firms within the past two years; there were 32 "yes" replies and 98 "no" replies. Participation on advisory committees was also queried: only 28 of the 132 businesses surveyed stated that persons from their firms served on advisory councils and among the 12,327 employees of these firms, only 41 persons were serving on advisory committees.[9]

Further evidence of lack of cooperative efforts was contained in the questionnaire which was distributed as part of this experimental project. As reflected in Table 1, relations between educators and industrial personnel have a one-way street. Teachers had had some contact with industry but have not made industry personnel active members of the team. Industry has remained a virtually untapped source of help.

Two important facts should be noted at this point. First, the formal advisory committee has been the most commonly used vehicle for promoting cooperation between industry and educational personnel in Utah and in other parts of the U. S. It has not, however, been utilized very extensively nor has it come close to exerting its potential role as a focus of other cooperative efforts.

Second, as Burt demonstrates in his book, the mandating of advisory committees may have unanticipated and undesired results:

> The result of ignoring other techniques and instrumentalities . . . for achieving cooperative effort has and will lead to simple compliance by local school systems in providing names of industry people who, at worst may not even be aware they are members of a "comittee"....Laws establishing a format for industry-education cooperation do not necessarily achieve it.[10]

He has proposed that involvement may be through informal and formal means and may include a "range of services" which may vary from "advisory" to "operational" depending on the leadership exercised by educators and the extent of industry involvement.[11]

The conclusion may then be drawn, as it is in the studies documented above, that a greater degree of cooperation between educators and industry personnel is needed. Kaufman and his colleagues at Pennsylvania State conclude that if favorable attitudes towards vocational education result from involvement with vocational education, then:

> the crucial problem becomes one of finding ways of increasing involvement for . . . its present level is low.[12]

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9. Vocational Education in Utah (Nashville, Tennessee: George Peabody College for Teachers, Division of Survey and Field Services, 1966), pp. 181-185.
10. Burt, Industry and Vocational-Technical Cooperation, pp. 321-322.
11. Ibid., pp. 5-6.
12. Kaufman et. al., Role of the Secondary Schools ... , p. 7-40.

Table 1A.
Number of Supervisory Participants Indicating Participation in Each Activity Before Project SIP (out of a total of 20)

| | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|
| Career Days in High School | 1 | - | - | - | - |
| Subject Area Advisory Committee | - | - | - | - | 5 |
| Visits to High School | 2 | 1 | - | - | - |
| Teaching Activities in High School | - | - | - | - | - |
| Teacher Visited in Plant | 2 | 2 | 4 | 1 | 5 |

Table 1B.
Number of Teachers Indicating Participation in Each Activity Before Project SIP (out of a total of 20)

| | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|
| Career Days | 9 | 10 | 11 | 10 | 10 |
| Field Trips to Industry | 8 | 9 | 9 | 14 | 7 |
| Instructor Visits to Industry | 5 | 9 | 14 | 14 | 13 |
| Advisory Committee Meetings | 1 | 1 | 3 | 9 | 5 |
| Apprenticeship Committee Meetings | 1 | - | - | - | - |
| Reading Professional Journals | 14 | 16 | 17 | 17 | 18 |
| Contact with Labor Unions | 2 | 1 | 1 | 1 | 1 |

Burt has reached a similar conclusion, and he stresses the value of industrial counsel in solving the problems confronting educators:

> . . . industry participation and involvement in the occupational program of our public school system is not a goal in itself. Rather it is the means for developing a sense of identification on the part of representatives from all segments of our economy in the programs and problems of the schools. To achieve this identification, more than occasional meetings and sporadic co-operative activities of educators and industry people is required. Educators must provide ways, means, and strategies so that industry people may identify themselves with, and feel themselves full-fledged partners in solving, the problems of the schools and school systems of our nation.[13]

The key idea in these recommendations seems to be <u>active involvement.</u> Industry personnel should be asked <u>to do something</u> instead of simply being asked to reply to questions of one type or another.

The problem to be solved by the experimental program was to go beyond the usual pattern of industry involvement in education programs. The idea was to expose teachers to the industrial situation so that they could evaluate their programs in relation to the needs of industry; to expose industrial personnel to school programs and the problems facing teachers; and to create a situation which would promote constructive ideas about how to bring the schools' programs closer to industry's needs. It was hoped that by initiating these relationships, further cooperation between these groupd would occur.

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13. Burt, "Industry Participation...", p. 199

## CHAPTER III

## DESCRIPTION OF THE RESEARCH DESIGN

### A. General Design

In order to accomplish the objective of the project, to increase knowledge, communication and cooperation among selected teachers, supervisors, and apprenticeship personnel for the purpose of bringing graduates of vocational T & I programs closer to the employment needs of industry, the following procedure was followed:

1. Initial Questionnaire - To obtain the participants' views about the adequacy of high school vocational preparation in their fields; their suggestions for improving or changing the vocational programs; and their ideas about problems faced by teachers of the various vocational subjects. This questionnaire is reproduced in Appendix E.

2. The Program

a. Visits to Schools - Supervisors from industry spent approximately one half day each month over a three month period observing the teaching of vocational Trade and Industrial education in the high school, each supervisor visiting the teacher with whom he was teamed.

b. Visits to Industry - Each T & I teacher spent approximately one half day each month observing the work performed, processes and equipment used, and employment requirements in his teammate's firm.

c. Apprenticeship Council Meetings - Each teacher was requested to attend one meeting of a Joint Apprenticeship Council or a meeting at which the director of one apprenticeship program explained the process of apprenticeship.

d. Subject Area Discussion Meetings - After the first and second set of visits, meetings were held for each skill area group at which participants were asked for their reactions to the above activities, their evaluation of the high school vocational program in view of what had been observed, and their ideas and suggestions for changes in the program.

3. Final Questionnaire - After conclusion of the program, to investigate the occurence of changes in the participants' ideas, opinions and suggestions since the beginning of the Project. This was examined in Part I of the Questionnaire. Part II examined the participants' reaction to the Project itself. The questionnaire is reproduced in Appendix F.

4. Evaluation Meeting - To provide an independent measure of the value of the suggestions for curriculum change which resulted from the Project.

5. Final Meeting - A final dinner meeting was held at the conclusion of the Project. In addition to the participants in the Project, Principals, District Superintendents, District Vocational Directors, managerial personnel from the industrial firms participating, as well as other influential persons who had cooperated with the project were invited to this dinner. It was hoped that this meeting would create greater interest among these administrators for further school-industry cooperative efforts.

## B. Population and Selection of Participants

The Population for this study consisted of teachers of Trade and Industrial Education courses in the Salt Lake, Davis, Granite, Jordan and Murray School Districts of Utah. The project was limited to four skill areas within the trade and industrial education category: auto mechanics, drafting, electronics, and machine shop (metals fabrication). Each district was requested to designate one teacher of vocational classes in each of these four skill areas to participate; in cases where no courses were offered in a district in the skill area, a teacher of that subject from another district was substituted. The investigators made no attempt to control the selection of teachers.

The population of industrial firms consisted of all businesses including military establishments in the area encompassed by the five participating school districts which would employ workers in the four skill areas enumerated above. For the selection of firms to participate in the Project, the aid of the Utah Department of Employment Security was enlisted. This agency compiled a list of firms of varying sizes and types within each skill area which could be contacted and asked to participate in the Project. Again, the investigators made no efforts to insure random inclusion of firms on the list. The investigators added some firms to this basic list to match the geographic distribution of participating schools more closely. The selection of supervisors was done by managerial personnel from each firm.

A weakness of this selection procedure was the fact that the group of participating firms was not, in some cases, representative of all of the kinds of jobs available for graduates of the various skill area programs. For example, the supervisory personnel in the auto mechanics skill area represented only automobile dealerships; other appropriate businesses would have been taxi cab and bus garages, rent-a-car agencies, and automobile service stations. Similarly, residential electricity and household electrical appliances were fields which could have been included in the electronics skill area group, although this difficulty was somewhat minimized by participation in the Project by electrical industry representatives from the Electricians Apprenticeship Council.

In order to avoid this problem, it would have been helpful, before selecting participants, to have listed a range of occupations which are filled by graduates of the programs in question, and then to have contacted appropriate industrial firms.

In selecting joint apprenticeship programs, the initial effort was to pick programs whose skill specialization would be close to the skill areas included in the Project. However, because of the limited number of joint apprenticeship programs in the Salt Lake area, some of the teachers observed council meetings of apprentice programs outside their teaching specialization (example - some machine shop teachers observed the council meetings of the Utah Pipe Trades Apprentice Program).

## C. Procedure

In order to obtain support for the research program discussed in this report, meetings were held with representatives of the Utah Manufacturers Association, the Utah AFL-CIO, the Utah Apprenticeship Council, and the Utah Department of Employment Security. The project was explained and endorsement was received from these organizations. Letters of support were received from the Manufacturers Association and the AFL-CIO (see Appendix D). The information from the Department of Employment Security concerning various industries has been described in the previous section. The Apprenticeship Council was most helpful in supplying information about the various apprenticeship programs. Enlisting the support of these organizations proved to be a wise decision, as some confusion concerning the purposes of the program arose later among some of the participants and these were useful channels for clarifying the project's aims.

Personal visits were made to each industrial firm and school district involved, in order to obtain permission to conduct the experiment. Most of the initial contacts were successful. The reasons for negative replies included:

| | No. of Times |
|---|---|
| Company reorganization | 1 |
| Wrong type of work | 1 |
| Most employees in another location, beyond the scope of the project | 1 |
| Too busy-unable to release employee | 2 |

Only the last of these might introduce a bias into the group participating: firms which do not regard vocational education as important would be more likely to claim that they have insufficient time to participate. However, beyond mild persuasion, no effort was made

to prevail upon these firms to participate; instead other firms were substituted. All of the originally selected school districts agreed to participate; in one case the principals of the high schools in the district were visited to enlist their support.

It is believed that it would have been better to have extended the personal contacts to all of the principals and preferably to the teachers, as well as to the supervisors in industry. Considerable misunderstanding about the Project's aims and/or procedures resulted from incorrect or insufficient communication between, for example, districts and schools, which might have been avoided had the investigators explained the Project personally to the participants.

Initiation of the Project took place at a dinner workshop meeting to which all of the participants were invited. Distribution of the first questionnaire took place at this meeting and teammates were introduced to each other.

The scheduling of visits was the responsibility of the participants. The visits were left relatively unstructured: only suggestions were made to the participants and it was stressed that whatever activities seemed appropriate and informative at the time of the visits should be pursued. The sheet of suggestions which was given to the participants is reproduced in Appendix C. At the suggestion of various participants, a change in the format was introduced for the third set of visits. If the team members thought it desirable, they were able during the final visit to observe schools and industries other than those to which they were originally assigned. Arrangements for such visits were the responsibility of the participants themselves; the State Office took no initiative in this matter.

The State Board of Education allocated money to pay for substitute teachers for days on which teachers were out of school (See Appendix B) and money to reimburse teachers for their travel expenses.

Two discussion meetings were held with the participants in each skill area group (auto mechanics, drafting, electronics, and machine shop). The purpose of the meetings was discussion of the participants' reactions to the visits to the schools, industries, and apprenticeship meetings; the evaluation of the various vocational programs in view of what had been observed; and ideas and suggestions for changes in the programs. A tape recording was made of each meeting.[1]

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1. See Appendix B; unfortunately, mechanical difficulties prevented the taping of both auto mechanics subject area discussions.

Following each discussion meeting, a summary of the meeting was made. Copies of the summary of the first meetings were distributed at the second discussions, and summaries of the second meetings were mailed to the participants so that they could be used in planning the final visits as well as in making final suggestions and evaluations.

The two questionnaires, one administered at the beginning of the program and one administered at the end of the program, were designed to obtain information about the participants' views concerning the adequacy of the high school vocational programs in their fields; their suggestions for improving or changing these programs; their ideas about problems faced by teachers of the various vocational subjects; and changes in these attitudes, suggestions, and ideas from the beginning of the project to its conclusion. The questionnaires were numbered so that individual pre- and post-responses could be matched. Two versions[2] of both the initial questionnaire and the final questionnaire were administered - supervisors and teachers received slightly different questionnaires. However, most of the questions were the same so that the responses of the different groups could be compared.

These questionnaires were distributed at the initial and concluding dinners; they were completed at home and returned by mail. Questionnaires were mailed to those who did not attend the dinners. About 8 days after administration of the initial questionnaire, a telephone follow-up was made on questionnaires which had not been returned; the final response rate was 100%. This high rate was not too surprising in view of the small size of the group, the thorough follow-up, and the concurrent involvement in various parts of the project. A similar telephone follow-up was done 6 days and again 12 days after administration of the second questionnaire. The response was 100% among the teachers and 85% among the supervisory personnel participating.

An evaluation meeting was held in the final phase of the project to provide an independent measure of the value of the various suggested program changes which resulted from the project. The panel which evaluated the suggestions was composed of people who had not been involved in the Project and therefore would be free of preconceived conclusions which might have developed from the Project activities. The members of the panel were:

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2. A third version of the questionnaires was distributed among the apprenticeship personnel who worked on the project. However, the very small number of respondents and the fact that the apprenticeship representatives did not visit the schools resulted in excluding them from discussion in this report.

Richard D. Francis - drafting teacher
Clearfield High School, Clearfield, Utah

John Gunderson - auto mechanics teacher
Highland High School, Salt Lake City, Utah

Kent Hathaway - electronics teacher
Granite High School, Salt Lake City, Utah

Harvey C. Hirschi - State Coordinator
for Vocational Education, Utah State Board
of Education

Dayton Hughes - Director of Vocational
Education, Provo City Schools, Provo, Utah

Joe. O. Luke - Specialist in Industrial
Arts, Utah State Board Of Education

William McKell - Director of Vocational
Education, Granite School District, Salt Lake
City, Utah

Walter E. Ulrich - State Coordinator for
Vocational Education, Utah State Board of
Education

Each suggestion was presented to the panel, then briefly explained and discussed. Each member of the panel rated each suggestion on a 5 point scale on three criteria; merits of the idea; practicality; and originality. The scores for each idea were averaged and a general rating was assigned to each idea.

# CHAPTER IV
# RESEARCH RESULTS

In evaluating the experimental project, four areas were examined:

A. Changes in attitudes and opinions concerning vocational educational programs.

B. Generation of ideas for changes in vocational education programs.

C. Closer cooperation between the participating teachers and industrial personnel.

D. Opinions of the participants in the program concerning the project itself.

The basic data for this evaluation was collected by means of the pre- and post-project administration of questionnaires. In addition, the group discussion meetings were the source of various suggestions for curriculum change, as well as additional information about cooperative efforts between the teachers and their industrial counterparts. The suggested curriculum and program changes were evaluated in the meeting of the evaluation panel.

## A. Changes in Attitudes

Was there any change in the attitudes of the project participants concerning vocational education programs during the project period?

One aim of the experimental program was to increase knowledge of vocational programs and improve communications among the participants. The questionnaires which were administered at the beginning and at the end of the project were designed to measure the participants' opinions concerning the adequacy of vocational offerings in Utah's high schools in their particular skill area and the areas in which changes should be made to better prepare students for jobs. It was hypothesized that if knowledge and communication had been increased, some change in attitudes should occur.

One question on the questionnaire asked the participants to indicate how well they believed the high school vocational programs in their fields were meeting industry's requirements. The distribution of replies on both administrations was as follows:

Table 2. Participants' Views of Adequacy of High School Vocational Training in Their Fields.

| | Excellent | Good | Adequate | Less than adequate | Poor |
|---|---|---|---|---|---|
| Supervisors Pre-* | - | - | 3 | 12 | 2 |
| Supervisors Post** | - | 1 | 5 | 6 | 3 |
| Teachers Pre+ | 1 | 1 | 2 | 13 | 1 |
| Teachers Post++ | - | 4 | 4 | 9 | 1 |

* - Don't know - 2 No answer - 1
** - Don't know - 1
\+ - Not usable - 2
++ - Not usable - 2

Although the changes from beginning to end were not statistically significant at the .05 level when a T Test was run, these scores show that changes in the participants' evaluations did occur. There was less concentration of responses at the "less than adequate" choice and it is suggested that this may reflect increased evaluative ability based on greater knowledge of the various vocational programs and their relation to the context of requirements for industrial employment.

The second question asked about the importance of changes in several areas of high school programs to better prepare students for jobs in the specific skill areas. The participants were asked to reply on a five-point scale from "Not Important" to "Extremely Important". The average ratings given to the various criteria are shown below, Table 3.

T Scores were calculated for this question also. The changes from

Table 3. Participants' Views of Importance of Changes in Various Aspects of School Programs (Average Ratings).

| | | Teachers Pre | Teachers Post | Supervisors Pre | Supervisors Post |
|---|---|---|---|---|---|
| A. | Course Content | 3.65 | 3.15 | 3.90 | 3.94 |
| B. | Equipment, Tools Texts | 3.90 | 3.25 | 3.80 | 3.75 |
| C. | Facilities | 3.70 | 3.30 | 3.60 | 3.13 |
| D. | Graduation Achievement Standards | 3.75 | 3.85 | 3.80 | 4.13 |
| E.* | | | | | |
| F. | Math | 3.80 | 3.75 | 4.20 | 3.94 |
| G. | Science | 3.45 | 3.35 | 3.30 | 3.27 |
| H. | Communications Skills | 3.63 | 4.10 | 4.40 | 3.94 |
| I.* | | | | | |
| J. | Vocational Counseling | 4.25 | 4.45 | 3.90 | 3.88 |
| K. | Grooming | 3.65 | 3.50 | 3.40 | 3.56 |
| L. | Maturity | 3.55 | 4.15 | 3.90 | 4.13 |
| M. | Attitude Towards Work | 4.60 | 4.60 | 4.70 | 4.56 |
| N.* | | | | | |

* E., I., and N. were "Other", insufficient number of responses for consideration.

Ratings:

1 - not important
2 - slightly important
3 - important
4 - very important
5 - extremely important

the first to the second administration were not statistically significant on any of the items for either the industrial supervisory group or the vocational teachers. However, some interesting ideas are suggested by observation of this data:

1. There was a general decline in the importance attached to changes in the physical aspects of vocational programs - facilities, equipment, text, and tools - among both groups.

2. There was a very slight decline in the importance of changes in two areas of curriculum - mathematics and science - among both groups, but there was a sizable increase in the importance of changes in the teaching of communications skills among teachers and a decrease in this area among supervisors.

3. Among both groups, the importance of greater maturity among graduates of high school vocational programs increased from the first to the second administration.

4. There was also agreement, both before and after the project, about the great importance of improving students' work habits and attitude towards work.

The lack of statistically significant findings on this area can have three possible explanations:

1. There was no increase in the participants' knowledge of vocational programs.

2. There was no change in ideas and opinions despite a gain in knowledge.

3. The questionnaire was not sensitive to whatever changes in ideas and opinions did take place.

## B. Generation of Ideas for Changes

Were there ideas generated during the project for changes in vocational education programs?

The experimental program was designed to bring vocational education in Utah's high schools closer to the needs of industry; it was hypothesized that a situation structured for the evaluation of teaching programs, the discussion of problems, and consideration of constructive ways of dealing with these problems would produce suggestions for additions to or changes in vocational programs.

The skill area discussion meetings were intended to follow the schod

and plant visits by providing the setting in which such exchange could take place. The meetings were lightly organized; the investigators found it useful to have a list of suggested topics for discussion but the participants generally discussed those topics which they considered most important. Among the main problems discussed at these meetings were:

1. Student deficiencies in verbal and mathematical skills - there should be less emphasis on abstract knowledge and more attention given to developing skills in these subjects.

2. Subjects which should be added to various courses or required of students taking various courses - areas in which gaps in the curriculum existed were pointed out by the industrial participants who suggested additions which would bring these areas closer to the requirements of industrial employers.

3. Class length - T & I classes should be sufficiently long so that technical projects and skills can be developed and sufficient attention given to each student's problems.

4. Problems involved in the acquisition of adequate equipment, materials, and teaching supplies - limited budget and lack of time for individual teachers to do "hunting" means that new systems for acquiring and using equipment and supplies efficiently should be developed.

In addition to the discussion meetings, observation of some of the team visits by the investigators suggests that most of the teams exchanged ideas at these visits as well as the group meetings.

The experimental program did, in fact, produce a series of ideas for changes in, or additions to, the courses involved in the project and for programs of vocational preparation in general. The specific suggestions will be listed as "Recommendations" in the next chapter, but here some indication of their evaluation will be made.

The evaluation panel considered most but not all of the ideas and rated each on a five-point scale on three criteria--merits, practicality, and originality. Two proposals which were thought to be credible but more controversial than the project-derived ideas were added for comparative purposes.

1. a. 3 of the 15 ideas were rated between 4 and 5 - very good to excellent.

   b. 8 of the remaining 12 were rated between 3.5 and 4.

c. 3 were rated between 3 and 3.5 and only 1 was rated below 3.

d. Both of the more controversial ideas received low ratings - below 3.

2. The average ratings on the 15 ideas were:

On merits - 4.32

On practicality - 3.85

On originality - 2.96

## C. Cooperation between Participants

Is there evidence that closer cooperation among the participating teachers and industrial personnel was brought about during the project?

It was hypothesized that the introduction of meetings between the participants would open the way for further cooperative efforts between educators and industrial personnel. We noted earlier that, before the project, relations between vocational teachers and industrial personnel were a "one-way street" among those participating in the project and, according to available evidence, in Utah in general.

In considering the evaluation of this aspect of the project, the following information should be noted:

1. 12 of the 17 supervisors replying to the post-questionnaire answered in the affirmative to a question which inquired if they taught or spoke to their teammates' classes during any of their visits. 13 of the 20 teachers also replied affirmatively.

2. 1 of the 17 supervisors reported that he had hired new employees as a result of their visits during the project. 3 said that they intended to do so in the near future. 3 teachers said that some of the students had been hired by their teammate's firm and 4 believed that such hiring would occur in the near future.

3. At least one group of students accompanied a teacher on his final visit to his partner's place of work.

4. One of the participating firms presented a set of teaching aids to all the teachers in that skill area (electronics).

Although these may not be dramatic, they are nonetheless tangible additions to the existing situation. It is worth noting that during the various discussions the value of contact between vocational students and industrial personnel was given considerable importance by the participants: students' interest and motivation were stimulated in a positive direction by their learning of industrial practices and the requirements and possibilities for employment from, as one of the participants said, "real people working at real jobs".

Many of the suggestions received from the project participants involved cooperative relations between industry and vocational teachers. To the surprise of the teachers as well as the members of the panel which evaluated these ideas, the industrial people thought that most of these suggestions could be implemented with relatively little trouble. This reinforces the idea that, in the past, industry has been an untapped source of assistance for the schools.

## D. Opinions of Participants

What are the opinions of the Project participants concerning the experimental Project?

A series of questions was included in the second questionnaire concerning the participants' views of Project SIP itself. Although it is realized that this is by no means an independent evaluation of the project, it is believed that such opinions are valuable when used in conjunction with the other information about the project.

There was general agreement that Project SIP was valuable and should be continued. 75% of the teachers and close to 60% of the industrial supervisors claimed that the project had been "very valuable" or "extremely valuable"; none of the participants said that the project had no value at all. Most agreed that they had learned something new. A majority of those participating said they had new ideas about what should be taught in high school vocational courses, although a quarter of the teachers were undecided about this. Half of the industrial participants said that they would be more likely to think of the high schools as a source of new employees and that future graduates of these vocational programs would likely be better prepared to work in their industry because of the program. The teachers felt the program was valuable because of their increased awareness of industrial practices, industry's greater awareness of the problems they faced as teachers, increased student motivation, and their own ability to prepare their students more adequately for employment. About 75% of the participants from both groups agreed that there would be increased opportunity for industry to work cooperatively with the schools as a result of the Project.

There was virtual unanimity that the type of school-industry relationship initiated in this program should become a regular part of the vocational education program. There were some changes suggested for the format of the program which will be reflected in the "Recommendations" in the next chapter. In addition, participants were asked about the efforts which were made to increase the atmosphere of congeniality surrounding Project SIP through the dinner meetings and the punch and cookies which were served during the discussion meetings. The general reaction of those replying to the second questionnaire was that these additions were useful but not indispensable parts of the program.

# CHAPTER V

## CONCLUSIONS AND RECOMMENDATIONS

### A. Conclusions

The type of school-industry cooperative program initiated in this experimental project proved to be an effective and valuable means of bringing vocational teachers into closer contact with the industrial context of their teaching programs. Specifically it was found:

1. No statistically significant changes occured in the participants' opinions about vocational education programs. However, there were some differences in the importance placed on changes in various aspects of high school vocational training to better prepare students for jobs. Also, it was noted that there was less tendency to cluster responses in evaluating vocational education, suggesting that increased evaluative ability may have resulted from increased knowledge of vocational programs and their relation to the context of requirements for industrial employment.

2. A series of ideas and suggestions for additions to or changes in vocational education programs emerged from the project. They were, for the most part, considered by an independent panel to be of high value and worth introducing into vocational education programs although not in all cases new or original ideas.

3. There were cooperative efforts by some of the participants which went beyond the scope of the original program and many of the industrial personnel did speak with students during their visits to the schools. In addition several of the suggestions which were developed by the participants for improving vocational programs involved cooperation between schools and industry. It is not known however if the three month program described in this report would provide a sufficient basis for further cooperative actions on the participants' own initiative. Further follow-up of this aspect of the program would seem to be in order.

4. The participants in the project generally believed this type of program to be valuable and recommended its continuation and expansion.

It had been expected before the initiation of the project that the main value of a program such as this would be in changing opinions concerning the adequacy of the particular vocational programs and which areas of these programs needed improvement. However, it would appear that its main value was in highlighting and discussing existing problems, suggesting ways to deal with them, and in

providing a basis for expanded cooperative activities among vocational teachers and industrial personnel.

## B. Recommendations

### A. Relating to the experimental program:

1. Project SIP should be continued.

2. It should be organized at the district level under the direction of the District Vocational Director.

3. All vocational teachers should be involved in the program and they should visit several different vocational partners each year, with the industrial people in turn visiting several different schools each year. Subject area discussions should be held approximately four times each year. Whenever possible apprenticeship visits should remain part of the program.

4. Principals and counselors should accompany teachers on the plant visits, be present at the classroom visits, and participate in the group discussions.

5. The program should be tried in a small number of districts, perhaps four, during the 1968-1969 school year. Two of these should be from among the five which participated in the original program.

6. For small districts, subject area conferences should be held on the regional level, with teachers from several districts meeting together.

7. A follow-up questionnaire should be administered to the participants in the original program during the coming winter to determine whether further cooperation took place bewteen the teachers and industrial personnel in the months following the project. If any of these districts participate in the implementation of the District level programs (see #5) an effort should be made to compare these districts with the others in the original program to determine if an organized program must be continued after the initial stage in order to maintain cooperative relations between the participants.

8. Dinners and Refreshments - Where financially possible, future programs of this type would be aided by dinner meetings and punch and cookies on a modest scale. Where provisions are impossible, this should not be regarded as an obstacle to implementation of the program.

B. Relating to programs and curriculum: these are not arranged according to priority; all of these ideas are considered important and worth implementing in the high schools in Utah.

1. Participants in all four subject areas agreed that the proper role for high school courses in auto mechanics, drafting, electronics and machine shop was the training of students in the fundamental knowledge and skills of each subject. Advanced knowledge of particular specialties and training for a particular industrial job can and should be done by post-high school institutions or employers.

2. Vocationally-oriented or applied English and mathematics courses should be developed to meet the needs of students who are not planning to attend college.

3. Training in soldering and in computer technology should be included in the course of study in electronics. Where necessary, there should be workshops preparing the teachers in these areas. Specifically, a one or two-week long workshop in computer technology should be developed in cooperation with local business firms in that industry, for example Sperry-Utah Univac Division of Sperry-Rand Corporation.

4. Students in machine shop courses should receive some training in related skills such as welding and forging.

5. Those drafting students who intend to pursue a career in architecture should be encouraged to take courses in fine arts as well as drafting.

6. All Trade and Industrial courses beyond those of an introductory level should be taught in blocs of at least two class periods in length.

7. Uniform minimum standards should be enforced in T and I classes throughout the State.

8. There should be a subscription to a high quality professional magazine for each vocational class in a school, copies of which should be kept in the vocational classroom if possible, and if not, in the school library.

9. Mobile teaching units should be developed for use in several schools or districts. These are particularly recommended where modern equipment is expensive and a week or two of intensive explanation and training would be sufficient to introduce students to latest methods and techniques.

10. The role of teachers in vocational counseling should be increased to take advantage of his teaching and work experience and his expertise in particular occupational fields.

11. Parents should be more involved in the vocational counseling process.

12. Teachers of vocational courses should be able to set minimum standards of performance so that these courses do not become a "dumping ground" for problem students.

13. Frequent meetings should be arranged between vocational counselors and industrial personnel to give the counselors better information about opportunities and requirements for employment.

14. Industrial personnel - "technical assistants" - should be invited to come into the high schools to teach in the vocational classes related to their occupational area for a few hours to a week at a time. Besides relieving the teacher this would utilize the special knowledge and skills of industry personnel and would also bring students into contact with these people.

15. The inclusion of at least two field trips each year to industrial firms related to the various skill areas should be required, or at least strongly recommended for all vocational classes.

16. Cooperative programs should be developed in which T and I students would be employed part-time in industrial jobs after receiving training in basic courses in their skill area. Such programs should permit the student to spend a half of the day in school and the other half day on-the-job.

17. Cooperative relationships between schools and industry should be developed to facilitate acquisition by the schools of equipment, spare parts, materials, and teaching aids.

18. Increased efforts should be made to encourage employers to recruit new employees through the high schools.

19. A system should be developed which would facilitate consideration by employers of training received by high school vocational students. This might include a standardized testing system, portfolio of work, or an instructor's record form; it would enable prospective employers to evaluate the knowledge and skills of graduates of these programs.

# APPENDIX A

## GROUPS PARTICIPATING IN PROJECT SIP

### A. HIGH SCHOOLS

#### Davis School District

Bountiful High School
Clearfield High School
Davis High School
Viewmont High School

#### Granite School District

Skyline High School
Granger High School
Cyprus High School
Granite High School
Kearns High School
Olympus High School

#### Jordan School District

Bingham High School
Hillcrest High School
Jordan High School

#### Murray School District

Murray High School

#### Salt Lake School District

West High School

### B. INDUSTRY

Freed Motor Company

Gordon Wilson Chevrolet, Inc.

Capital Chevrolet, Inc.

Bountiful Motors

Petty Ford

Panushka & Peterson, Architects

Bush & Gudgell, Inc.

P-M Engineering

Utah Power & Light Co.

Mountain States Telephone Co.

Hill Air Force Base

Electronic Memories, Inc.

Litton Industries, Data Systems Div.

Sperry-Utah, Univac Div. of Sperry-Rand Corp.

Eimac - Div. of Varian Corp.

Eimco Corporation

A. W. Fors Machine Shop

McGee & Hogan Machine Works

Tech-Steel, Inc.

## C. APPRENTICESHIP PROGRAM

Sheet Metal Workers International Association

Utah Carpenters Joint Apprenticeship Training

Electricians Joint Apprenticeship Committee

Apprenticeship Program Eimco Corporation

Utah Pipe Trades Education Program

## APPENDIX B

## ADMINISTRATIVE NOTES

### 1. Substitute Teachers

The responsibility of arranging for substitute teachers was left to the teacher and the school districts. Money was allocated in the Project budget for substitute teachers and it was hoped that this would minimize the objections and difficulties involved in taking teachers out of the classroom during school hours. In general, this system worked well. In some cases student teachers were regularly scheduled to teach particular classes, so no problem was involved in making arrangements. In other instances, if there were problems arranging for substitutes, other teachers in the school were able to cover classes, or participating teachers visited industry after school, during hours when they had no classes scheduled, or on Saturdays. Although similar problems may arise, this should not be permitted to be an insurmountable obstacle to initiation of such a program.

### 2. Discussion Meetings

A. It was most helpful to tape-record the discussion meetings. It freed the investigators from the necessity of being preoccupied with note-taking, etc., and permitted later playback for the purpose of making summaries of the meetings, discussion by the researchers etc. In order to overcome the possible inhibitive effects of a tape recorder, the participants did not identify themselves when they spoke; in addition, it was explained that the tape would be used only for the researchers' convenience and would not serve to identify the views of particular individuals. The fact that some of the discussions became quite frank and candid suggests that such inhibitive effects were in fact minimized. The use of a tape recorder is recommended for use in future activities of this type.

B. It was helpful to have copies of the official State curriculum in the particular subject area available for examination in at least one discussion meeting of each group. This enabled better discussion of course content and various related matters, and prevented wasting valuable time trying to establish what is supposed to be taught. The teachers were able to explain what actually is taught and which topics are omitted.

## APPENDIX C

## SUGGESTIONS FOR VISITS

One of the most important aspects of Project SIP is the exchange of visits by project participants--teachers visiting industry and apprenticeship programs, and supervisory and apprenticeship people visiting the schools. These visits are designed to increase participants' knowledge of industrial conditions and educational programs, with the aim of improving vocational education programs to meet industry's needs more satisfactorily while enabling industry to have realistic expectations about the scope of school curricula. In order to increase the success of visits, we would like to make the following suggestions:

1. The program for these visits should be as flexible as possible. The objective should be to expose each participant to the widest possible range of conditions and situations.

2. In visiting the schools, the following areas might be observed:
   a. Classes in the appropriate skill area (e.g., auto mechanics, drafting, electronics, machine shop)--including course content, equipment being used, theoretical knowledge and practical skills.
   b. Classes in other subjects--mathematics, science, English, etc.
   c. The problems experienced by the teacher which makes his job as a vocational teacher difficult.
   d. Any other areas which the teacher or the supervisory and apprenticeship people think is important.

3. In visiting the industrial shop, it is suggested that the teachers consider the equipment and processes being used; the degree of skill required; the amount of personal responsibility and maturity demand of employees.

4. In their visits to apprenticeship programs, teachers might note the types of training given the apprentices and the standards and requirements used in evaluation.

Please note that these are only <u>suggestions</u>. Other aspects of each situation may seem important at the time of these visits, depending upon previous discussions among the participants or problems which have been observed.

In all parts of the project it is important to keep in mind the following questions:

How well are the high school vocational programs preparing their students to meet the requirements of industry and post-school training?

Are industry's expectations and requirements realistic in view of the established high school programs?

ORGANIZED 1905

# UTAH MANUFACTURERS ASSOCIATION

GENERAL OFFICES KEARNS BUILDING

TELEPHONE 363-3885

SALT LAKE CITY, UTAH 84101

December 5, 1967



Dear Members of the Utah Manufacturers Association and Industry within the State of Utah:

The Utah State Board for Vocational Education is conducting a research project entitled, Solving Industrial Problems, "SIP." The general aim and objective of the "SIP" program is to increase communication among teachers, supervisors and apprenticeship leaders in the Salt Lake Valley.

Mr. Jed W. Wasden, Specialist with the Utah State Board for Vocational Education and Mrs. Donna Grushka are the people from the state board who will contact you for your help. It is important industry provide the necessary information and help from your supervisory staff.

We would appreciate your cooperation and suggestions on this project that will be beneficial to industry, to education and to labor. We would be happy to answer any further questions that you might have concerning this program.

Sincerely,

UTAH MANUFACTURERS ASSOCIATION

Frank V. Nelson
Counsel & Administrator

FVN/j

APPENDIX D(2)

# INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS

LOCAL UNION NO. 57

14

1743 WEST NORTH TEMPLE
SALT LAKE CITY, UTAH 84116

PHONE 328-8681

December 12, 1967

TO WHOM IT MAY CONCERN:

The Utah State Board for Vocational Education is conducting a research project entitled Project "SIP" - Solving Industrial Problems. The general aim and objective of this program is to increase communication among teachers, supervisors, and apprenticeship and other labor representatives in the Salt Lake Valley.

Mr. Jed W. Wasden, Specialist for Trade and Industrial Education at the State Board for Vocational Education and Mrs. Donna Grushka will contact you for your help. I would appreciate your cooperation with the Board on this project which will benefit labor, management, and education. I will be happy to answer any questions you might have concerning this program.

Sincerely,

R.A. Hedquist

R.A. Hedquist
Business Manager

RAH/bm

## APPENDIX E

## FIRST QUESTIONNAIRES

TEACHERS

UTAH STATE BOARD FOR VOCATIONAL EDUCATION
Office of the State Administrator
of Vocational and Technical Education
Salt Lake City, Utah 84111

PROJECT "SIP"

Purpose: This questionnaire is being used as part of Project "SIP", and is designed to provide information to be used in conjunction with a later questionnaire in evaluating the project. The success of the program will depend upon your frank and honest answer to these questions. No individuals will be identified and no answers will be released except as part of the final evaluation.

1. Educational background: Which of the following educational grades have you completed? (Check all which are applicable to you.)

   Secondary School - Vocational Program_____
   Some college, but no degree _____
   Post-secondary technical school _____
   College degree _____
   Other (please specify) _____

2. Total number of years experience teaching this subject. _____ (fill in blank)

3. What was the most recent year in which you worked in industry in a field related to your subject? From _____ (date) to _____ (date)

   What was the title of the position that you held at the end of that time? _____ (title)

4. Indicate which of the following activities you have participated in within the past five years by giving the approximate number of times you have done each.

| | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|
| Career days | ____ (no. of times) | ____ | ____ | ____ | ____ |

4. (Con't.)

| | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|
| Field trips to industry | ___ | ___ | ___ | ___ | ___ |
| Instructor visits to industry | ___ | ___ | ___ | ___ | ___ |
| Advisory committee meetings | ___ | ___ | ___ | ___ | ___ |
| Apprenticeship committee meetings | ___ | ___ | ___ | ___ | ___ |
| Reading professional journals | ___ | ___ | ___ | ___ | ___ |
| Contacts with labor unions | ___ | ___ | ___ | ___ | ___ |
| Other (describe)_____ | ___ | ___ | ___ | ___ | ___ |

_____

5. How well do you think graduates of Utah's high school __(skill area)__ programs are meeting the requirements of industry? (Check one)

( ) Excellent
( ) Good
( ) Adequate
( ) Less than adequate
( ) Poor

6. How important do you think changes in the following areas of high school programs in Utah would be to better prepare the students for jobs in __(skill area)__ ? Circle one answer for each category. Consider the average answer to be those under "Important".

| Not Important | Slightly Important | Important | Very Important | Extremely Important | Vocational Education |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | Course content |
| 1 | 2 | 3 | 4 | 5 | Equipment, tools, texts |
| 1 | 2 | 3 | 4 | 5 | Facilities |

| Not Important | Slightly Important | Important | Very Important | Extremely Important | |
|---|---|---|---|---|---|
| | | | | | Vocational Education |
| 1 | 2 | 3 | 4 | 5 | Graduation achievement standards |
| 1 | 2 | 3 | 4 | 5 | Other (specify) _____ |
| | | | | | General Education |
| 1 | 2 | 3 | 4 | 5 | Math |
| 1 | 2 | 3 | 4 | 5 | Science |
| 1 | 2 | 3 | 4 | 5 | Communications skills |
| 1 | 2 | 3 | 4 | 5 | Other (specify) _____ |
| | | | | | Guidance |
| 1 | 2 | 3 | 4 | 5 | Vocational counseling |
| 1 | 2 | 3 | 4 | 5 | Grooming |
| 1 | 2 | 3 | 4 | 5 | Maturity |
| 1 | 2 | 3 | 4 | 5 | Attitude toward work |
| 1 | 2 | 3 | 4 | 5 | Other (specify) _____ |

7. Please specify in detail the changes you would consider most important to make in the areas you indicated in question 6.

_____

_____

_____

8. In your opinion, what does industry believe to be the major

... (weakness of the graduates of the high school (skill area) programs in Utah.

_____

_____

_____

9. What aspects of the total school program contribute most to the job success of the graduates of the (skill area) programs in Utah?

_____

_____

_____

10. As a teacher of (skill area) what are your main problems? For example, equipment out of date, little chance for liaison with industry, scheduling difficulties, or any other areas which you feel are of importance.

_____

_____

_____

_____

11. What do you think is the proper role of high school vocational programs in preparing students for employment? (Circle the answer that best approximates your opinion.)

a. Providing basic background in mathematics, science and communications skills, and leaving all vocational knowledge and skill training to employers, apprenticeship programs, and other post-high school programs.

b. Providing basic background in mathematics, science and communications skills, as well as some preparation in the student's vocational area, while leaving most intensive vocational and skill training to post-high school training sources, including employers, apprenticeship and other programs.

c. The high schools should provide sound vocational, as well as general preparation, but should stop short of specific preparation for individual jobs.

d. The high schools should provide intensive enough preparation for jobs that students can go immediately into the work situation with only a minimal amount of specific training.

e. The high schools should provide skill training which will prepare students to continue advanced training in a post-secondary school.

f. Some other role, please describe _____

_____

UTAH STATE BOARD FOR VOCATIONAL EDUCATION
Office of the State Administrator
of Vocational and Technical Education
Salt Lake City, Utah 84111

PROJECT "SIP"

Purpose: This questionnaire is being used as part of Project "SIP", and is designed to provide information to be used in conjunction with a later questionnaire in evaluating the project. The success of the program will depend upon your frank and honest answer to these questions. No individuals will be identified and no answers will be released except as part of the final evaluation.

1. Educational background: Which of the following educational grades have you completed. (Check all which are applicable to you.)

   Secondary School - Vocational Program _____
   Some college, but no degree _____
   Post-Secondary Technical School _____
   College degree _____
   Other (please specify) _____

2. Total number of years working experience _____ (fill in blank)

3. Size of your firm. _____ (approximate number of employees)

4. Number of employees over whom you are a supervisor _____ (fill in number)

5. Are any of your subordinates graduates of the high school (skill area) vocational program? Yes ( ) No ( ) Don't Know ( ). If yes, indicate the approximate number _____ What additional training did these (skill area) graduates have after high school graduation? Indicate the approximate number in each category.

| Number of Subordinates | Type of Training |
|---|---|
| _____ | Don't know |
| _____ | Trade-technical college |

5. (Con(t.)

| Number of Subordinates | Type of Training |
|---|---|
| _____ | Apprenticeship |
| _____ | On-the-job training |
| _____ | Other (specify)_____ |
| _____ | None |

6. Indicate which of the following activities you have participated in within the past five years by giving the approximate number of time you have done each.

| | 1963 | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|---|
| Career days in high school (# of times) | ____ | ____ | ____ | ____ | ____ |
| Subject area advisory committees | ____ | ____ | ____ | ____ | ____ |
| Visits to high Schools | ____ | ____ | ____ | ____ | ____ |
| Teaching activities in high school | ____ | ____ | ____ | ____ | ____ |
| Other (please describe) _____ | ____ | ____ | ____ | ____ | ____ |

7. How well do you think graduates of Utah's high school (skill ar a) programs are meeting the requirements of your industry? (Check one)

( ) Excellent
( ) Good
( ) Adequate
( ) Less than adequate
( ) Poor

8. How important do you think changes in the following areas of high school programs in Utah would be to better prepare students for jobs in (skill area)?
Circle one answer for each category. Consider the average answer to be those under "Important."

| Not Important | Slightly Important | Important | Very Important | Extremely Important | Vocational Education |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | Course content |
| 1 | 2 | 3 | 4 | 5 | Equipment, tools, texts |

8. (Con't.)

| Not Important | Slightly Important | Important | Very Important | Extremely Important | |
|---|---|---|---|---|---|
| | | | | | **Vocational Education** |
| 1 | 2 | 3 | 4 | 5 | Facilities |
| 1 | 2 | 3 | 4 | 5 | Graduation achievement standards |
| 1 | 2 | 3 | 4 | 5 | Other (specify) _____ |
| | | | | | **General Education** |
| 1 | 2 | 3 | 4 | 5 | Math |
| 1 | 2 | 3 | 4 | 5 | Science |
| 1 | 2 | 3 | 4 | 5 | Communications skills |
| 1 | 2 | 3 | 4 | 5 | Other (specify) _____ |
| | | | | | **Guidance** |
| 1 | 2 | 3 | 4 | 5 | Vocational counseling |
| 1 | 2 | 3 | 4 | 5 | Grooming |
| 1 | 2 | 3 | 4 | 5 | Maturity |
| 1 | 2 | 3 | 4 | 5 | Attitude towards work |
| 1 | 2 | 3 | 4 | 5 | Other (specify) _____ |

9. Please specify in detail the changes you would consider important to make in the areas you indicated in question 8.

_____

10. What are the major weaknesses of the graduates of the high school (skill area) programs in Utah?

11. What do you think are the main problems faced by teachers of (skill area) in Utah high schools?

12. What do you think is the proper role of high school vocational programs in preparing students for employment? (Circle the answer that best approximates your opinion.)

a. Providing basic background in mathematics, science and communications skills, and leaving all vocational knowledge and skill training to employers, apprenticeship programs, and other post-high school programs.

b. Providing basic background in mathematics, science, and communications skills, as well as some preparation in the student's vocational area, while leaving most intensive vocational training to post-high school training sources, including employers, apprenticeship and other programs.

c. The high schools should provide sound vocational, as well as general preparation, but should stop short of specific preparation for individual jobs.

d. The high schools should provide intensive enough preparation for jobs that students can go immediately into the work situation with only a minimal amount of specific training.

e. The high schools should provide skill training which will prepare students to continue advanced training in a post-secondary school.

f. Some other role, please describe.

APPENDIX F
TEACHERS'
SECOND QUESTIONNAIRE

PART I

Same as First Questionnaire -
Appendix E

PART II

1. Please indicate the number of times you attended each of the following activities as part of Project "SIP":

Visits to school _____
Visits to industry _____
Apprenticeship meeting _____
Group discussion meetings _____

2. If, on the last set of visits, you visited schools and/or businesses other than those to which you were originally assigned, please check here _____ and indicate where you visited. _____

_____

3. How valuable to you has Project "SIP" been?

Extremely valuable ( )
Very valuable ( )
Valuable ( )
Not too valuable ( )
Not valuable at all ( )

4. Circle the answer which best reflects your feelings about each statement in regard to Project "SIP".

| | Strongly Agree | Agree | Undecided | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 1. The purposes of the project were clear to me. | 1 | 2 | 3 | 4 | 5 |
| 2. I didn't learn anything new. | 1 | 2 | 3 | 4 | 5 |
| 3. I have better understanding of industry's needs in my subject area. | 1 | 2 | 3 | 4 | 5 |

4. (Con't.)

| | Strongly Agree | Agree | Unde-cided | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 4. I have new ideas about what should be taught in high school vocational courses. | 1 | 2 | 3 | 4 | 5 |
| 5. I wasn't sure what we were supposed to do on the visits. | 1 | 2 | 3 | 4 | 5 |
| 6.. The discussion meetings accomplished a great deal. | 1 | 2 | 3 | 4 | 5 |
| 7. The apprenticeship meeting exposed me to something new. | 1 | 2 | 3 | 4 | 5 |
| 8. My time was well spent. | 1 | 2 | 3 | 4 | 5 |
| 9. The Project did not meet my expectations. | 1 | 2 | 3 | 4 | 5 |
| 10. I would like to continue to meet with my teammate. | 1 | 2 | 3 | 4 | 5 |
| 11. I would like to have worked with additional teammates. | 1 | 2 | 3 | 4 | 5 |

5. Please rank these parts of the Project in the order of their value to you. Give the most valuable portion #1, the next most valuable #2, and the least valuable portion #4.

Visits to schools _____
Visits to industry _____
Apprenticeship meeting _____
Group Discussion Meeting _____

6. What changes in organization (form) would you suggest for each of the following parts of Project "SIP"? If none, please indicate NONE.

Visits to schools _____

_____

Visits to industry_____

_____

Apprenticeship meeting_____

_____

Group discussion meetings _____

_____

7a. Should the type of school-industry relationship initiated in Project "SIP" become a regular part of the education program?

Yes ( )

No ( ) If no, proceed with Question #8

7b. If yes, which of the following types of programs do you think would be most valuable? Please check one.

( ) 1. All vocational teachers should have a permanent partner from industry whom he would visit a few times each year, visiting the same man each year.

( ) 2. All vocational teachers should be involved in the program, but their partner from industry should change each year.

( ) 3. All vocational teachers should be involved in the program and they should visit several different industrial partners each year, with the industrial people in turn visiting several different schools each year.

( ) 4. Only a small group of teachers should be involved each year in visiting and meeting with industrial people; the specific members of the group would change each year.

( ) 5. Some other format (please specify) _____

_____

7c. If such a program was established, how often do you think the subject area discussion meetings should be held? Please check one.

7c. (Con't.)

Once a year _____
Twice a year _____
Four times a year _____
Every other month _____
Once a month _____
Not at all _____

7d. At which level, other than the State Board of Education, do you think such a program should be organized?

The districts should organize it. _____
The schools should organize it. _____
The teachers should arrange it themselves. _____

8. Efforts were made to increase the congeniality of Project "SIP". These efforts included the two dinners and the punch and cookies which were served at the discussion meetings. Please indicate how important you think these were for the success of the Project. (Please check one.)

Dinner Meetings

_____ They were vital for the Project's success.

_____ They were of considerable importance to the success of the Project.

_____ They contributed something to the success of the Project.

_____ They were of slight value to the overall success of the Project

_____ They were unimportant for the success of the Project.

Punch and Cookies

_____ They were vital for the Project's success.

_____ They were of considerable importance to the success of the Project.

_____ They contributed something to the success of the Project.

_____ They were of slight value to the overall success of the Project.

_____ They were unimportant for the success of the Project.

9. Listed below are a number of ways in which Project "SIP" may have been valuable. Please circle any of these which made it valuable <u>to you.</u>

a. It gave me an opportunity to see what industry is doing.

b. It was valuable to have my teammate meet with the principal and counselor in my school.

c. My students were motivated as a result of the visit of my teammate.

d. I received helpful ideas that I can incorporate into my teaching.

e. Industry will now be more aware of the problems faced by teachers.

f. The State School Office will be more aware of the problems faced by teachers.

g. I think that I can now prepare my students more adequately for employment.

h. I think that the main value will come from changes introduced in the State curriculum and requirements.

i. I was able to up-date my knowledge of industrial processes in my field.

j. I think of my teammate as someone with whom I can cooperate in the future.

k. I think that the prestige of my program in the school has been improved.

l. There will be increased opportunity for industry to work cooperatively with the schools as a result of the Project.

10. Please indicate here any other thoughts and reactions you may have concerning (a) vocational education in general; (b) vocational education in your particular field (auto mechanics, drafting, electronics, machine shop); and/or (c) the "SIP" Program. We would welcome any suggestions you hay have.

_____

_____

_____

Please answer the following questions as part of Part II of this questionnaire.

When your teammate visited in you school:

1. Did he observe any classes other than your vocational skill area classes? yes ( ) no ( ) If yes, please specify which classes these were. _____ _____.

2. Did you and your teammate meet with your principal ? yes ( ) no ( ) Did you and your teammate meet with your vocational counselor? yes ( ) no ( )

3. Did your teammate speak to or teach your class? yes ( ) no ( )

4. Were any of your students hired by your teammate's firm as a result of Project "SIP"? yes ( ) no ( )

When you visited your partner's firm:

1. Did your students accompany you on any of your visits? yes ( ) no ( )

2. Were you given the opportunity to participate in the work being performed? yes ( ) no ( )

3. Did you spend time with personnel other than your teammate? yes ( ) no ( )

APPENDIX F

SUPERVISORS'
SECOND QUESTIONNAIRE

PART I

Same as First Questionnaire -
Appendix E

PART II

1. Please indicate the number of times you attended each of the following activities as part of Project "SIP":

   Visits to school _____
   Visits to industry _____
   Group discussion meetings _____

2. If on the last set of visits you visited schools and/or businesses other than those to which you were originally assigned, please check here _____, and indicate where you visited._____

3. How valuable to you has Project "SIP" been?

   Extremely valuable ( )
   Very valuable ( )
   Valuable ( )
   Not too valuable ( )
   Not valuable at all ( )

4. Circle the answer which best reflects your feelings about each statement in regard to Project "SIP".

| | Strongly Agree | Agree | Undecided | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 1. The purposes of the project were clear to me | 1 | 2 | 3 | 4 | 5 |
| 2. I didn't learn anything new | 1 | 2 | 3 | 4 | 5 |
| 3. I have new ideas about what should be taught in high school vocational courses | 1 | 2 | 3 | 4 | 5 |
| 4. I wasn't sure what we were supposed to do on visits | 1 | 2 | 3 | 4 | 5 |
| 5. The discussion meetings accomplished a great deal. | 1 | 2 | 3 | 4 | 5 |

| | Strongly Agree | Agree | Undecided | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 6. My time was well spent | 1 | 2 | 3 | 4 | 5 |
| 7. The project did not meet my expectations | 1 | 2 | 3 | 4 | 5 |
| 8. I would like to continue to meet with my teammate | 1 | 2 | 3 | 4 | 5 |
| 9. I would like to have worked with additional teammates | 1 | 2 | 3 | 4 | 5 |
| 10. I would be more willing to hire a graduate of the high school (skill area) program now than before the project | 1 | 2 | 3 | 4 | 5 |

5. Please rank these parts of the project in the order of their value to you. Give the most valuable portion No. 1, the next most valuable No. 2, and the least valuable portion No. 3.

Visits to schools _____
Visits to industry _____
Group discussion meeting _____

6. What changes in organization (form) would you suggest for each of the following parts of Project "SIP"? If none, please indicate NONE.

Visits to schools _____

Visits to industry _____

Group discussion meetings _____

7. A. Should the type of school-industry relationship initiated in Project "SIP" become a regular part of the education program?
Yes ( ) No ( ) If no, proceed with question 8.

7. B. If yes, which of the following types of programs do you think would be most valuable? (please check one)

( ) 1. All vocational teachers should have a permanent partner from industry whom he would visit a few times each year, visiting the same man each year.

( ) 2. All vocational teachers should be involved in the program, but their partner from industry should change each year.

( ) 3. All vocational teachers should be involved in the program and they should visit several different industrial partners each year, with the industrial people in turn visiting several different schools each year.

( ) 4. Only a small group of teachers should be involved each year in visiting and meeting with industrial people; the specific members of the group would change each year.

( ) 5. Some other format (please specify)_____

7. C. If such a program were established, how often do you think the subject area discussion meetings should be held? (Please check one)

Once a year_____
Twice a year_____
Four times a year_____
Every other month_____
Once a month _____
Not at all _____

8. Efforts were made to increase the congeniality of Project "SIP". These efforts included the two dinners, and the punch and cookies which were served at the discussion meetings. Please indicate how important you think these were for the success of the Project. (Please check one)

Dinner Meetings

_____ They were vital for the Project's success.

_____ They were of considerable importance to the success of the Project.

_____ They contributed something to the success of the Project.

_____ They were of slight value to the overall success of the Project

_____ They were unimportant for the success of the Project.

Punch and Cookies

_____ They were vital for the Project's success.

_____ They were of considerable importance to the success of the Project.

_____ They contributed something to the success of the Project.

_____ They were of slight value to the overall success of the Project.

_____ They were unimportant for the success of the Project.

9. Listed below are a number of ways in which Project "SIP" may have been valuable. Please check any of these which made it valuable to you.
If none apply, you need not circle any.

a. I am better able to evaluate prospective employees.
b. I am more likely to think of the schools as a source of new employees.
c. It was valuable to meet with the school's principal, voc. counselor.
d. My subordinates were motivated when my teammate visited.
e. It was good public relations for our firm.
f. I think that future graduates of the high school voc. (skill area) program will be better prepared to work in my industry because of the Project.
g. There will be increased opportunity for us in industry to work co-operatively with the schools as a result of the Project.

10. Please indicate here any other thoughts and reactions you may have concerning (a) vocational education in general; (b) vocational education in your particular field (auto mechanics, drafting, electronics, machine shop) and/or (c) the "SIP" Program. We would welcome any suggestions you may have. _____

_____

Please answer the following questions as part of Part II of this questionnaire.

During your visits to your teammate's school:

1. Did you observe any classes other than the voc. (skill area) classes?
Yes ( ) No ( ) If yes, please specify which classes _____

2. Did you meet with theprincipal of the high school? Yes ( ) No ( )
Did you meet with the school's voc. counselor? Yes ( ) No ( )

3. Did you speak to or teach your teammate's class? Yes ( ) No ( )

4. Did you recruit any new employees for your firm as a result of your Project "SIP" visit? Yes ( ) No ( )

When your partner visited in your firm:

1. Was he given an opportunity to participate in the work being performed?
Yes ( ) No ( )

2. Did he spend time with personnel other than yourself? Yes ( ) No ( )



2-3

END